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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LI, ZHUO H

ART UNIT

PAPER NUMBER

2185

MAIL DATE

DELIVERY MODE

01/22/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/790,169	Applicant(s) MOGA ET AL.	
	Examiner ZHUO H. LI	Art Unit 2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office action is in response to the amendment filed on 11/3/2008, claims 1-8 and 17-21 are canceled and claims 9-16 are pending in the application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 9-11 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Irie et al. (US PAT. 6,038,644 hereinafter Irie).

Regarding claim 9, Irie discloses a method comprising determining at a first node, i.e., processing unit (10-i) whether a cache miss relating to a memory unit of a shared memory system, i.e., multiple processing system (figure 1) of a plurality of nodes, i.e., processing units (10-1 to 10n, figure 1) including the first node and employing a coherence protocol should be selectively broadcast only to a sub-plurality of nodes lesser in number than the plurality of nodes but greater than one based on a criteria, i.e., only transfer to part of the processing units which are likely to have a copy of the data by the determination of the destination information stored within the multicast table (400, figure 1) and (col. 4 lines 30-45, col. 5 lines 28 through col. 6 line 14), and in response to determining that the cache miss should be selectively broadcast only

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to the sub-plurality of nodes, i.e., destination information stored within the multicast table (col. 4 lines 35-45, col. 9 line 1 through col. 12 line 33), selectively broadcasting the cache miss by the first node only the sub-plurality of nodes (col. 11 line 46 through col. 12 line 67).

Regarding claim 10, Irie discloses a method further comprising in response to determining that the cache miss should not be selectively broadcast to the sub-plurality of nodes, broadcasting the cache miss by the first node to all of the plurality of nodes (col. 8 lines 49-67).

Regarding claim 11, Irie discloses the criteria including whether selective broadcasting is likely to reduce total communication traffic among the plurality of nodes and unlikely to increase latency as compared to broadcasting the cache miss to all of the plurality of nodes to reach an owning node for the memory unit (col. 4 lines 46-58 and col. 9 line 1 through col. 12 line 67).

Regarding claim 15, the limitations of the claim are rejected as the same reasons set forth in claims 9 and 11.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 12-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irie et al. (US PAT. 6,038,644 hereinafter Irie) in view of Steely, JR. et al. (US 2005/0160430 hereinafter Steely).

Regarding claim 12, Irie differs from the claimed invention in not specifically teaches to determine whether the cache miss should be selectively broadcast to the sub-plurality of nodes comprising determining whether the first node is a home node for the memory unit, such that selectively broadcasting the cache miss to the sub-plurality of node comprising selectively broadcasting the cache miss to one node of plurality of nodes as an owning node for the memory unit as stored at a directory of the first node as the home node for the memory unit. However, Steely teaches a multi-processor system including an owner predictor control, i.e., logic, that a processor is operable to generate two parallel requests for a desired cache line in response to cache miss, i.e., one request to home node and another request to predicted target processors as predicted by the owner predictor control, in order to reduce latency associated with retrieving data ([0054] through [0056]). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the coherent system of Irie in determining whether the cache miss should be selectively broadcast to the sub-plurality of nodes comprising determining whether the first node is a home node for the memory unit, such that selectively broadcasting the cache miss to the sub-plurality of node comprising selectively

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broadcasting the cache miss to one node of plurality of nodes as an owning node for the memory unit as stored at a directory of the first node as the home node for the memory unit, as per teaching by Steely, because it reduces latency associated with retrieving data.

Regarding claim 13, Irie differs from the claimed invention in not specifically teaching to determine whether the cache miss should be selectively broadcast to the sub-plurality of nodes comprises determining whether the first node has a pre-stored hint as to a potential owning node for the memory unit, such that selectively broadcasting the cache miss to the sub-plurality of nodes comprises selectively broadcasting the cache miss both to a home node of the memory unit and to the potential owning node for the memory unit. However, Steely discloses the system wherein the logic, i.e., owner predictor control, within each node to determine whether the cache of the node has stored a hint, as to a potential owning node for the memory unit as a result of an earlier event in determining that transmission to the sub-plurality of nodes lesser in number than the plurality of nodes is likely to reduce total communication traffic among the plurality of nodes and unlikely to increase latency to ultimately reach the owning node for the memory unit ([0050] and [0054] through [0056]). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Irie in determining whether the cache miss should be selectively broadcast to the sub-plurality of nodes comprises determining whether the first node has a pre-stored hint as to a potential owning node for the memory unit, such that selectively broadcasting the cache miss to the sub-plurality of nodes comprises selectively broadcasting the cache miss both to a home node of the memory unit and to the potential owning node for the memory unit, as per teaching of Steely, because it reduces latency associated with retrieving data.

Regarding claim 14, Irie differs from the claimed invention in not specifically teaching to determine whether the cache miss should be selectively broadcast to the sub-plurality nodes comprises determining whether the memory unit relates to a predetermined memory sharing pattern encompassing the sub-plurality of nodes, such that selectively broadcasting the cache miss to the sub-plurality of nodes comprises selectively broadcasting the cache miss to the sub-plurality of nodes. Steely discloses the system wherein the logic, i.e., owner predictor control, within each node is to determine whether the memory unit relates to a predetermined memory sharing pattern encompassing the one or more nodes in determining that transmission to the one of more nodes lesser in number than the plurality of nodes is likely to reduce total communication traffic among the plurality of nodes and unlikely to increase latency to ultimately reach the owning node for the memory unit ([0017]). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Irie in determining whether the cache miss should be selectively broadcast to the sub-plurality nodes comprises determining whether the memory unit relates to a predetermined memory sharing pattern encompassing the sub-plurality of nodes, such that selectively broadcasting the cache miss to the sub-plurality of nodes comprises selectively broadcasting the cache miss to the sub-plurality of nodes, as per teaching of Steely, because reduces latency associated with retrieving data.

Regarding claim 16, the limitations of the claims are rejected as the same reasons set forth in claim 12.

Response to Arguments

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6. Applicant's arguments filed 11/3/2008 have been fully considered but they are not persuasive.

In response to applicant's argument that Irie does not disclose selectively broadcasting a cache miss by first node only to sub-plurality of nodes (see page 6 of remark, Irie teaches notification of a cache miss being sent to the status control logic such that the status control logic in response to this notification generates a coherent processing request, which is transferred to other nodes (e.g., processor units), thereby the cache miss itself is not transferred to other nodes, in contradistinction to the claimed invention, but rather a coherent processing request is generated in response to the cache miss and it is the coherent processing request that is transferred to other nodes in Irie), examiner respectfully disagrees because applicant's argument is mis-leading. It is noted that Irie clearly teaches to generate a coherent processing request in respond to cache miss notification (col. 4 lines 30-450 such that the coherent processing request clearly includes cache miss, thereby the coherent request as used in Irie is considered as a cache miss. Note the claimed language fails to explicitly define how to broadcast cache miss. Thus, the broad claimed language can be read by Irie. Therefore, Irie anticipates the claimed invention to selectively broadcasting a coherent request/a cache miss to other nodes.

In response to applicant's argument that Irie in view of Steely does not suggest to determining whether the cache miss should be selectively broadcast to the sub-plurality of nodes by at least determining whether the first node - from which the cache miss is selectively broadcast - is a home node for the memory unit to which the cache miss in question relates, that is, at least part of determining whether a first node should selectively broadcast a cache miss to a sub-plurality of other nodes is determining whether the first node itself is the home node for the

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memory unit to which the cache miss relates, examiner respectfully disagrees because Steely clearly teaches a processor 117 generating a first request to the home node 180, i.e., a database or table, to determine the state of the cache line and the location of an owner node or processor, i.e., the home node associated with the cache line ([0055]), wherein processor 117 can be a given owner processor, i.e., a home node, or one or more local processors 118-120 can be selected when no predicted owner is available ([0053]-[0054]). Thus, Steely clearly teaches to determining whether the cache miss should be selectively broadcast to the sub-plurality of nodes by at least determining whether the first node - from which the cache miss is selectively broadcast - is a home node for the memory unit to which the cache miss in question relates. Therefore, Irie in view of Steely does render the claimed invention *prima facie* obvious and unpatentable.

7. Applicant's arguments with respect to claim 16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZHUO H. LI whose telephone number is (571)272-4183. The examiner can normally be reached on Mon - Fri 6:00am - 2:30pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on 571-272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan V. Thai/
Primary Examiner, Art Unit 2185

Zhuo H Li
Examiner
Art Unit 2185

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/Z. H. L./

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